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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,659	12/11/2001	Branimir Simic-Glavaski	SIMIP105USA	4787
7590 03/02/2004			EXAMINER	
Warren A. Sklar Renner, Otto, Boisselle & Sklar, LLP 19th Floor 1621 Euclid Avenue Cleveland, OH 44115-2191			HASAN, MOHAMMED A	
			ART UNIT	PAPER NUMBER
			2873	
DATE MAILED: 03/02/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/014,659

Applicant(s)

SIMIC-GLAVASKI, BRANIMIR

Examiner

Mohammed Hasan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 34 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 - 4, 6, 7, 9, 11, 12, 15, 16, 19, 21, 25 - 27, 29, 30 is/are rejected.  
7) ☒ Claim(s) 5, 8, 10, 13, 14, 17, 18, 20, 22- 24, 28, 31 - 34 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Oath/Declaration***

1. Oath and declaration filed on 12/11/2001 is accepted.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 4, 6, 7, 9, 11, 9, 11, 12, 15, 16, 19 – 21, and 25 – 27, 29, and 30 are rejected under 35 U.S.C 102 (b) as being anticipated by Simic – Glavaski (4,804,930).

Regarding claim1, Simic – Glavaski discloses (refer to figures 1, 2 and 6) an switching device (3) comprising a macrocyclic molecule (40) arrangement in at least one of substantially one dimensional stack arrangement or a two dimensional (e.g., molecule 40 substantially one dimensional stack arrangement as shown in figure 6) arrangement being absorbed on a substrate (50) (column 5, lines 55 – 65, column 15, lines 51 – 56).

Regarding claim 2, Simic – Glavaski discloses, arrangement being absorbed on a metal substrate (143) (as shown in figure 5, column 16, lines 56 - 63).

Regarding claim 3, Simic-Glavaski discloses (refer to figure 2) arrangement being absorbed on a semiconductor substrate (50) (column 5, lines 55 – 65).

Regarding claim 4, Simic- Glavaski discloses, a macrocyclic molecules (40) in an arrangement are metallated (column 9, lines 38 – 47).

Regarding claim 6, Simic – Glavaski discloses (refer to figures 12 , 2 and 6 ) a memory device ( 150) comprising a macrocyclic molecule (40) arrangement at least one of substantially one dimensional stack arrangement or a two dimensional arrangement ( e.g., as shown in figure 6) , arrangement being absorbed on a substrate ( 50) ( column 15, lines 51 – 56, column 17, lines 29 - 45).

Regarding claim 7, Simic-Glavaski discloses (refer to figure 12) an information storage and retrieval apparatus comprising the memory device (150) and further comprising an input to apply optical or electrical input, and a detector (154) to detect output or response from the memory device (column 18, lines 5 - 10).

Regarding claim 9, Simic – Glavaski discloses, an output for producing a signal representative of the response of the detector (10) (e.g., Raman spectrophotometer) to the memory device (150) (column 17, lines 57 - 67).

Regarding claim 11, Simic – Glavaski discloses, a reversible switch (3) with multiple outputs (as shown in figure 1).

Regarding claim 12, Simic – Glavaski discloses, arrangement of macrocyclic molecules (60) comprising metallated macrocyclic molecules (column 9, lines 38 - 47).

Regarding claim 15, Simic-Glavaski discloses (refer to figures 1 and 6) a switching device (3) comprising applying an input to an arrangement of macrocyclic molecules (40) in at least of a substantially one dimensional stack – like or ring like structure or a substantially two dimensional sheet like structure (e.g., one dimensional stack or ring like structure as shown in figure 6) and responding to multiple outputs (column 5, lines 55 – 65).

Regarding claim 16, Simic- Glavaski discloses detecting an optical response using a Ramon spectrophotometer (10) (column 6, lines 29 – 37).

Regarding claim 19, Simic – Glavaski discloses (refer to figures 1 and 6) an optical device comprising a monomeric metallated phthalocyanine (e.g., molecule 40, column 4, lines 29 – 34) that behaves as fast ( $< 10^{-12}$  second), energy efficient (30 KT/bit of information), a quantum switch (3) with multiple outputs, where the monomeric phthalocyanines are organized in structural combination of at least one of one dimensional wire-like ring-stacked, or two dimensional sheet – like ring –fused phthalocyanines (as shown in figure 6, column 9, lines 38 - 47) ( column 5, lines 55 – 65).

Regarding claim 21, Simic – Glavaski discloses (column 9, lines 12 - 32) molecular monomeric units or in general electrochemically semi-organized form, can provide a electro-optic properties including at least one of fast switching effect, multilevel logic, memory states.

Regarding claim 25, Simic – Glavaski discloses, the phthalocyanine structures are in the form of a monomer (column 9, lines 38 - 47).

Regarding claim 26, Simic-Glavaski discloses, the phthalocyanine structures are in the form of a ring stacked (as shown in figure 6, column 9, lines 38 – 47).

Regarding claim 27, Simic – Glavaski discloses, the phthalocyanine structures are in the form of a monomer polymer sheet (as shown in figure 6).

Regarding claim 29, Simic – Glavaski discloses (refer to figures 1- 6) a method of making an optical device comprising a monomeric metallted phthalocyanine structure that behaves as a fast, energy efficient, a quantum switch (3) with multiple outputs, where the monomeric phthalocyanine are organized in structural combinations of at least one of dimensional wire-like ring stacked, or two dimensional sheet-like ring-fused phthalocyanines (e.g., as shown in figure 6), comprising tailoring number of peaks in a cyclic voltmmogram representation of operation of the device according to the number of stacked rings in the “wire” ( column 5, lines 55 – 65).

Regarding claim 30, Simic – Glavaski et al discloses (refer to figures 2 and 7) which include an electro-optical device (2) comprising a plurality of macrocyclic molecules (40) in a substantially one-dimensional ring-like stacked or in a substantially two – dimensional sheet-like arrangement, and absorbing the same to a conductor or semiconductor substrate (50) (column 15, lines 51 – 56, column 18, lines 33 - 44).

### ***Allowable Subject Matter***

3. Claim 5, 8, 10 13, 14, 17, 18, 20, 22- 24, 28, 31 – 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

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independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter: the metallated molecules include or more metals selected from the group cobalt, iron, nickel, silver, gold, palladium, platinum, aluminum, detector comprising a nuclear magnetic resonance device, detector comprising a tunneling microscope, metallo – phthalocyanine, silicon phthalocyanine, ring stacked silicon phthalocyanine with a base on the order of 1x1 nm length, which depends on number of molecules, the molecular metallated phthalocyanine behaves with properties that can replace a multiplicity of CMOS and similar classic semiconductor, the two dimensional arrangement of macrocyclic molecules comprises a two dimensional arrangement of fused macrocyclic molecules, the phthalocyanine molecule can form basically three structural form , and the macrocyclic molecules in a substantially two dimensional sheet – like structure comprises applying the input to a substantially two dimensional sheet – like structure of fused macrocyclic molecules .

### ***Response to Arguments***

5. Applicant's arguments filed 12/29/2003 have been fully considered but they are not persuasive.

In response to applicant's arguments that Simic-Glavaski (4,804,930) discloses (refer to figure 2) a molecule 40, which is preferably a macrocyclic material (column 8,

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lines 10 – 15). The molecule 40, preferably are of the macrocyclic type that have electro – optic characteristics (column 8, lines 47 – 50). Simic-Glavaski also discloses absorbed molecules are on an electrode surface (column 4, lines 21 – 22). Molecules 40 are actually absorbed onto an electrically conductive substrate 141 (e.g., surface of the substrate, which is two dimensional molecule arrangement) (column 16, lines 45 – 48). Claim 1 refer to a macrocyclic molecule arrangement at least one of a substantially one dimensional stack arrangement or a two dimensional arrangement.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The closest prior art

Gryko et al (6,324,091 B1) discloses tightly coupled porphyrin macrocycles for molecular memory storage.

Clausen et al (6,272,038 B1) discloses high – density non-volatile memory device incorporating thiol derivatized porphyrin trimers.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not



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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammed Hasan whose telephone number is (571) 272-2331. The examiner can normally be reached on M-TH, 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272- 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MH  
February 18, 2004

  
Georgia Epps  
Supervisory Patent Examiner  
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